

**A NEEDS ANALYSIS OF NFPA 1500, STANDARD ON FIRE DEPARTMENT
OCCUPATIONAL SAFETY AND HEALTH PROGRAM, 1997 EDITION, AND THE
ORANGE COUNTY EMERGENCY SERVICES DISTRICT #1**

EXECUTIVE PLANNING

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ABSTRACT

The Orange County Emergency Services District #1 (OCESD #1) must implement an occupational safety and health program that follows the requirements of the National Fire Protection Association (NFPA) Standard, NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, to reduce the frequency and severity of job-related injuries (Kerwood, 1997, p. 48). The problem was that OCESD #1 did not conduct a needs analysis related to NFPA 1500 and the safety and health issues facing the District. The purpose of this research was to analyze whether NFPA 1500 was the correct program to address the safety and health issues facing the District. This study used a descriptive research methodology to answer the following questions:

1. How does NFPA 1500 meet the needs of OCESD #1?
2. How does NFPA 1500 not meet the needs of OCESD #1?
3. What does OCESD #1 need to do to correct the deficiencies identified in NFPA 1500?

Surveys were prepared and distributed to the 40 members of OCESD #1 to identify their knowledge of NFPA 1500. Additionally, three management members completed the NFPA 1500 Worksheet to compare OCESD #1's safety program to the standard. The results of the research indicated that 100% of the survey respondents agreed with the requirements of NFPA 1500. Also, OCESD #1 complies with 52.7%

of the standard's applicable sections.

The recommendations of the research paper were

1. OCESD #1 must adopt NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, to reduce the frequency and severity of job-related injuries.
2. OCESD #1 must implement the time frames that were identified in the NFPA 1500 Worksheet for the administrative and fiscal sections.
3. OCESD #1 must budget for the items identified in the research.
4. OCESD #1 must develop an organizational attitude that does not reward nor recognize injuries as "part of the job."

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INTRODUCTION

Problem Statement

The Orange County Emergency Services District #1 (OCESD #1) must implement an occupational safety and health program that follows the requirements of the National Fire Protection Association (NFPA) Standard, NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, to reduce the frequency and severity of job-related injuries (Kerwood, 1997, p. 48). The problem was that OCESD #1 did not conduct a needs analysis related to NFPA 1500 and the safety and health issues facing the District.

Purpose Statement

The purpose of this research was to analyze whether NFPA 1500 was the correct program to address the safety and health issues facing the District. This study used a descriptive research methodology to answer the following questions:

1. How does NFPA 1500 meet the needs of OCESD #1?
2. How does NFPA 1500 not meet the needs of OCESD #1?
3. What does OCESD #1 need to do to correct the deficiencies identified in NFPA 1500?

BACKGROUND AND SIGNIFICANCE

A study of the Orange County Emergency Services District #1 Workers' Compensation records indicated a high number of on-the-job injuries. Table 1, Table 2, Table 3, and Table 4 show a five-year comparison of OCESD #1 Workers' Compensation injury statistics from 1991 through 1995 (Kerwood, 1997, pp. 33-44). According to the study, by analyzing the data, OCESD #1 can classify any safety deficiencies as engineering, education, or enforcement (Kerwood, 1997, p. 6).

Table 1 illustrates the activities that OCESD #1 firefighters were conducting when injuries occurred (Kerwood, 1997, p. 37). Of the total reported injuries, fireground injuries accounted for 68.5%; other on-duty injuries, 12.9%; non-fire emergency injuries, 16.7%; training injuries, 0.0%; and responding and returning injuries, 1.9%.

Table 2 shows the nature of injuries suffered by OCESD #1 firefighters for this five-year time period (Kerwood, 1997, pp. 33-34). Of the total reported injuries, strains, sprains, and muscle pains accounted for 29.6%; wounds, cuts, bleeding and bruises, 25.9%; smoke or gas inhalation, 11.1%; thermal stress from frostbite or heat, 9.3%; fire or chemical burns, 7.4%; other injuries, 7.4%; dislocation and fracture, 3.7%; eye irritations, 3.7%; heart attacks or strokes, 1.9%; and other respiratory distress, 0.0%.

Table 3 illustrates the causes of OCESD #1 firefighter injuries (Kerwood, 1997,

Table 1

OCESD #1 Firefighter Injuries by Type of Duty by Year

Duty	Year											
	1995		1994		1993		1992		1991		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Responding,												
Returning	0	0.0	0	0.0	1	4.2	0	0.0	0	0.0	1	1.9
Fireground	7	63.6	10	71.5	17	70.8	2	66.7	1	100.0	37	68.5
Nonfire-												
Emergency	2	18.2	1	7.	6	25.0	0	0.0	0	0.0	9	16.7
Training	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Other On-Duty	2	18.2	3	21.4	1	4.2	1	33.3	0	0.0	7	12.9
Total	11	100.0	14	100.0	25	100.0	3	100.0	1	100.0	54	100.0

Table 2

OCESD #1 Firefighter Injuries by Nature of Injury by Year

Nature	Year									
	1995		1994		1993		1992		1991	
	N	%	N	%	N	%	N	%	N	%
Burns (Fire or Chemical)	2	18.2	1	7.1	0	0.0	33.3	0.0	0	0.0
Smoke, Gas										
Inhalation	1	9.1	0	0.0	5	20.0	0	0.0	0	0.0
Other Resp										
Distress	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Eye Irritation	0	0.0		7.1	1	4.0	0	0.0	0	0.0
Wound, Cut, Bleeding, Bruise	2	18.2		50.0	5	20.0	0	0.0	0	0.0
Dislocation, Fracture	0	0.0		0.0		4.0	33.3	0.0	0	0.0
(table continues)										
Total										

Nature	Year									
	1995		1994		1993		1992		1991	
	N	%	N	%	N	%	N	%	N	%
Heart Attack,										
Stroke	0	0.0	0	0.0	1	4.0	0	0.0	0	0.0
Strain, Sprain,										
Muscle Pain	3	27.3	2	14.3	9	36.0	1	33.3	1	100.0
Thermal Stress										
(Frostbite, Heat)	0	0.0	2	14.3	3	12.0	0	0.0	0	0.0
Other	3	27.3	1	7.1	0	0.0	0	0.0	0	0.0
Total	11	100.0	14	99.9*	25	100.0	3	99.9*	1	100.0

* Rounding Error

pp. 40-41). For this time period, fell, slipped, or jumped accounted for 27.0% of the total recorded injuries. The other injury categories were as follows: stepped on or contact with an object, 24.3%; injuries from overexertion or strains, 16.2%; exposure to fire products, 13.5%; injuries due to extreme weather conditions, 10.8%; being stuck by an object, 5.4%; exposure to chemicals or radiation, 2.7%; being caught or trapped, 0.0%.

Table 4 illustrates the OCESD #1 lost-time injuries by body part for the reported time period (Kerwood, 1997, p. 44). Of the total reported lost-time injuries, the trunk accounted for 60.0%; body systems accounted for 20.0%; upper extremities and lower extremities each accounted for 10.0%; and head and other accounted for 0.0%.

The study recommended that OCESD #1 revise its occupational safety and health program if the number of on-the-job injuries were to be reduced (Kerwood, 1997, p. 48). By implementing an occupational safety and health program that follows NFPA 1500, the District can better manage the risks that are inherent to the fire service. Additionally, reducing the injury severity and frequency will enable OCESD #1 to avoid being placed on the Texas Workers' Compensation Commission (TWCC) Extra-Hazardous Employer Program. The Extra-Hazardous Employer Program identifies employers whose injury rates are substantially higher than those of similar sized employers in the same industry, requires implementation of accident-prevention plans, and levies fines of up to \$5,000 per day for non-compliance with the program

Table 3

OCESD #1 Firefighter Injuries by Cause by Year

Cause	Year							
	1995		1994		1993		1992	
	N	%	N	%	N	%	N	%
Total								
Fell, Slipped								
Tripped			30				50	
Over ratio								
Struck			20					
Stepped								
Contact with			20					
Struck by								
Exposure to								
Radiation								

(continued)

Cause	Year									
	1995		1994		1993		1992		1991	
	N	%	N	%	N	%	N	%	N	%
Exposure to										
Production		28						50		
Caught, trapped										
Extraction										
With										
Other										
Total		00				00			00	00
99										
Founding Err										

Table 4

OCESD #1 Firefighter Lost-Time Injuries by Body Part

Body Part	1991 - 1995	
	N	%
Head	0	0.0
Upper Extremities		
Trunk	6	60.0
Lower Extremities	1	
Body Systems	2	20.0
Other	0	0.0
Total	10	

(Kerwood, 1997, p. 2). However, there had not been any research into whether NFPA 1500 was the correct program to help reduce the injury experience.

The National Fire Academy (NFA) Executive Planning course emphasized “analysis” as it relates to project leadership and project management. The Executive Planning course uses a four-phase process for analyzing the needs of a fire department: Phase 1 - Establish Guidelines; Phase 2 - Needs Analysis; Phase 3 - Feasibility Study; and Phase 4 - Project Specifications (National Fire Academy [NFA], 1995, SM 5-3). This applied research project is directly related to the Executive Planning course, with “Needs Analysis” as the basis for the research.

Analysis is defined as breaking something into its parts to examine how they fit together. It provides the executive fire officer with a better understanding of the details supporting the current operations (NFA, 1995, p. SM 5-3). By analyzing NFPA 1500 in relation to where OCESD #1's safety program currently stands, the District can see if NFPA 1500 is the document to help revise the program.

LITERATURE REVIEW

NFPA 1500 was the first fire service document to address the safety and health needs of firefighters (Loflin, 1990, p. 19). It was written for the purpose of making the profession less dangerous by reducing the risk of accidents, injuries, and fatalities (Peterson, 1997, p. 10-64). The standard, was developed to meet or exceed the

criteria listed in Subpart L of the Occupational Safety and Health Administration (OSHA) requirements. Rubin and Foley (1993, p. 46) describe NFPA 1500 as a “benchmark” or measurement of a comprehensive fire department safety and health program. According to Peterson (1997, p. 10-68), a fire department occupational safety and health program developed and implemented in compliance with NFPA 1500 is instrumental in securing the highest possible levels of health and safety, given the hazardous nature of firefighting.

Peterson (1997, p. 10-65) also notes that a fire service occupational safety and health program can be difficult to develop and implement because of the wide variety of issues that need to be addressed. However, NFPA 1500 addresses firefighter health and safety as an overall program that creates a work environment that will manage the “risk” to members of the department. Risk management is the identification and analysis of exposure to hazards, selection of appropriate risk management techniques to handle exposures, implementation of chosen techniques, and monitoring of results, with respect to the health and safety of members (National Fire Protection Association [NFPA], 1997, p. 1500-7).

The concept of “risk management” is not new. Private sector safety professionals use risk management as a tool to help keep personal injuries, human suffering, and severe economic losses, to a minimum (Nielson, 1991, p. 1). However, to the fire service, risk management as it relates to firefighter safety is new. Schaper

and Gerner note that if the fire service would use with regularity the private sector safety professional tools of engineering, education, and enforcement, firefighter injuries would see a decline in unprecedented numbers (Kerwood, 1997, p. 4). Risk management for both the fire service and general industry share the same prime objective: conservation of the organization's assets, property, and human life alike (Nielson, 1991, p. 1). It is important to note that risk management also reduces "tort claims." A tort is any socially unreasonable conduct for which a court of law will grant money damages to compensate an individual for a loss, whether the conduct was intentional or neglect (Coleman, 1994, pp. 4-5).

Nielson (1991, p. 1) states that the absence of risk management practices in the fire service is reflective of a negative attitude towards safety. This is substantiated by firefighters who state that safety is a relative concept and that injuries are the price to pay for being a firefighter (Kerwood, 1997, p. 4). Whether safety is a key value to an organization is clearly announced everyday to every firefighter through the organization's culture. How firefighters see the organization's values dictates their behavior in the workplace (Coleman, 1994, pp. 6-7). If the safety program is to succeed, a department-wide commitment to safety is required, from the chief fire executive to the newest recruit firefighter (Murgallis, 1993, p. 6). An organizational attitude that does not reward nor recognize injuries as "part of the job" must be developed. Management must perpetuate an attitude that injuries are preventable (Kerwood, 1997, p. 48). Moreno (1991, p. 6) cites the following private sector example

of an organization's safety culture:

The culture of the organization in their approach to safety is one of attitude and commitment. The best example of how this theory works can best be exemplified by the Du Pont De Nemours Company. Many years ago when Du Pont De Nemours Company went into business they manufactured explosives for construction. They were experiencing enormous loss of production, property, and more important loss of lives. There was no mystery as to what the problem was, they simply did not have an effective safety program. The solution implemented by the Du Pont De Nemours Company to correct the problem was to move the manager of the plant and his family to the premises. Although this was an extreme measure to take, they no longer experienced any accidents at their plants. Since then, the Du Pont De Nemours Company has appeared to be a prototypical company in their approach to safety.

Colman (1994, p. 5) notes that a positive safety attitude for the employees teaches them to be observant of public safety also. Additionally, whenever a good safety program and attitude is perpetuated in the fire department, the cost effectiveness of the program could mean a 30% to 60% decrease in the direct costs resulting from on-the-job injuries.

NFPA 1500 is not a mandatory requirement for any fire service organization until it has been adopted by an Authority Having Jurisdiction (AHJ) (Peterson, 1997,

p. 10-64). However, NFPA 1500 can be cited as a prevailing standard of care and used as law whether or not the standard is adopted (Fornell, 1993, p. 64). According to Ball (1989, p. 2), in the event an accident giving rise to a negligence lawsuit were to occur, the test of whether the actions taken were appropriate would be whether they met the appropriate standard of care. A jury would be asked to determine whether or not a “reasonable and prudent person” would have acted the same under the same circumstances (Rukavina, 1993, p. 10).

Some concern over the adoption and implementation of NFPA 1500 has stemmed from the argument of “home rule.” Home rule seeks to grant a measure of policy-making power to municipalities and to obtain general authority to undertake and administer local programs in matters not dealt with in legislative statutes (Jones, 1983, p. 206). There exists in the fire service a basic disagreement whether local fire chiefs can establish effective safety programs or whether a national standard of care should be legislated to protect both firefighters and the general public (Even, 1993, p. 14). Some city leaders feel that local jurisdictions can develop a safety and health program that is as effective as NFPA 1500. However, according to Stittleburg, the very existence of NFPA 1500 provides opportunities to argue that any equipment or operating procedures which do not comply with the standard are unsafe or substandard (Turner, 1990, p. 3). Currently several states are considering the adoption of NFPA 1500 in whole or in part, and the Federal government is considering a revision of OSHA Subpart L that includes replacing it with NFPA 1500 (Loflin, 1990, p. 19).

Brunacini states that a fire department must define and take control of its own future by adopting NFPA 1500 before it is done for them (Manning, 1992, p. 8).

Nationwide, probably the largest factor in determining whether a fire department adopts the standard is the question of finances and the area's willingness to provide funding for compliance with the standard (Craig, 1991, p. 3). Coleman (1994, p. 7) notes that the fire service has not accepted financial hardships as an excuse from the general public for not following codes and standards and thus allowing unsafe conditions to exist. If NFPA 1500 is imposed by an outside AHJ such as the courts or the Federal government, it will impose a serious financial burden on the entire fire service, whether or not it is prepared and financially able to cope with the implementation of the standard (Coleman, p. 10). According to Loflin (1990, p. 21), the fire service must accept the principle that general industry has known for years: Safety is a good business practice. The goal of stopping firefighter deaths and injuries can be realized only through the development and implementation of a comprehensive safety and health program using NFPA 1500 (Rubin, 1993, p. 46).

PROCEDURES

Population

A survey was conducted using the 40 members of the Orange County Emergency Services District #1. Additionally, three OCESD #1 management members were used to complete the NFPA 1500 Worksheet.

Instrumentation

Two tools were used to compile data for the research. Appendix A shows the NFPA 1500 Worksheet, which is included in the NFPA 1500 Standard (NFPA, pp. 1500-46 - 1500-60). This document, which consisted of 328 open-ended questions regarding a fire department's compliance with NFPA 1500, was used to compare OCESD #1's safety program to the national standard. Each of the worksheets was returned on time.

The survey, which is shown in Appendix B, consisted of ten closed-ended questions. These questions were as follows:

1. How many years do you have in the fire service?
2. What is your rank or position?
3. What is your primary area of responsibility?
4. What is your secondary area of responsibility?
5. Have you been injured while on-the-job during your fire service career?
6. What "Duty" were you performing when you were injured?
7. What was the "Nature" of your injury?
8. What was the "Cause" of your injury?
9. Have you read NFPA 1500?
10. If "Yes," do you have a feeling for the general requirements listed in the ten chapters?

Questions 1 through 4 were used to determine the demographics of the respondents. Questions 5, 6, 7, and 8 were used to determine the injury history of the respondents. The remaining two questions were used to determine the knowledge of the respondent with NFPA 1500. Thirteen (32.5%) surveys were received on or before the established deadline. Twenty-seven (67.5%) surveys were not returned.

Data Collection

NFPA 1500 compliance data were compiled for each section of the standard. The results were then listed for the entire document. Raw data were compiled from each survey. The results were then listed for each respondent.

Assumptions

Several assumptions were made for this paper.

1. Each respondent had read NFPA 1500.
2. Each respondent had knowledge of his or her injury history.
3. Each respondent would answer the questions honestly.

Limitations

Several limiting factors must be considered for this research.

1. The NFPA 1500 Worksheet was open-ended, leaving room for interpretation on behalf of the respondent.

2. The survey sample size does not adequately represent the entire population of OCESD #1 during the time of the first study.
3. The survey was written by a student in the Executive Fire Officer Program.

Definition of Terms

The following term was used in the survey and is presented here for clarity:

NFPA 1500: The National Fire Protection Association (NFPA) Standard on Fire Department Occupational Safety and Health Program.

RESULTS

Of the survey respondents, two members (15.4%) had less than 1 year of fire service experience; six (46.2%) had 1 to 5 years; two (15.4%) had 6 to 10 years; two (15.4%) had 11 to 15 years; zero (0.0%) had 16 to 20 years, and one (7.7%) had over 20 years of experience. Two (15.4%) of the respondents were recruits; six (46.2%) were firefighters; three (23.1%) were lieutenants; one (7.7%) was a captain; one (7.7%) was a dispatcher; and zero (0.0%) of the respondents held any other fire department rank. As for the primary area of responsibility, one (7.7%) respondent indicated command; ten (76.9%) indicated fire suppression; zero, (0.0%) indicated fire investigation, communications, or public education; and two (15.4%) indicated administration. The secondary area of responsibility was as follows: fire suppression, four (30.8%); command, two (15.4%); fire investigation, one (7.7%); communications, one (7.7%); public education, four (30.8%); administration, one (7.7%). Ten (76.9%) of

the respondents indicated that they had read NFPA 1500, with four (40.0%) of these respondents stating that they strongly agree with the standard. Three (30.0%) of the respondents very strongly agree with the standard, and three (30.0%) agree.

Six of the respondents (46.2%) answered that they had been injured while on-the-job in their fire service career. Table 5, Table 6, and Table 7 show these six respondents' injuries according to work being performed, type of injury, and reason for the injury.

Table 5 illustrates the activities that the respondents were conducting when their injuries occurred. Of the total reported injuries, fireground injuries accounted for 83.3%; non-fire emergency injuries, 16.7%; other on-duty injuries, 0.0%; training injuries, 0.0%; and responding and returning injuries, 1.9%.

Table 5

Respondents Injuries by Type of Duty

Duty	N	%
Responding, Returning	0	0.0
Fireground	5	83.3
continues)		(table

Duty	N	%
Nonfire-Emergency	1	16.7
Training	0	0.0
Other On-Duty	0	0.0
Total	6	100.0

The nature of injuries suffered by the respondents is presented in Table 6. Of the total reported injuries, strains, sprains, and muscle pains accounted for 16.7%; wounds, cuts, bleeding and bruises, 16.7%; thermal stress from frostbite or heat, 16.7%; other injuries, 16.7%; and dislocation and fracture injuries, 16.7%. The remaining injury categories each accounted for 0.0% of the total reported injuries.

Table 6

Respondents Injuries by Nature of Injury

Nature	N	%
Burns (Fire or Chemical)	0	0.0
Smoke, Gas Inhalation	0	0.0

(table continues)

Nature	N	%
Other Resp Distress	0	0.0
Wound, Cut, Bleeding, Bruise	1	16.7
Dislocation, Fracture	1	16.7
Heart Attack, Stroke	0	0.0
Strain, Sprain, Muscle Pain	1	16.7
Thermal Stress (Frostbite, Heat)	1	16.7
Other	1	16.7
Total	6	100.2*

* Rounding Error

Table 7 illustrates the cause of the respondents' injuries. The categories stepped on or contact with an object and injuries from being struck by an object each accounted for 33.3% of the total recorded injuries. The other injury categories were as follows: injuries from overexertion or strains, 16.7%; other injuries, 16.7%; fell, slipped, or jumped, 0.0%; exposure to chemicals or radiation, 0.0%; exposure to fire products,

0.0%; being caught or trapped, 0.0%; and extreme weather condition injuries, 0.0%.

Table 7

Respondents Fireground Injuries by Cause

Cause	N	%
Fell, Slipped, Jumped	0	0.0
Overexertion, Strain	1	16.7
Stepped on, Contact with	2	33.3
Struck by	2	33.3
Exposure to Chem, Rad	0	0.0
Exposure to Fire Products	0	0.0
Caught, Trapped	0	0.0
Extreme Weather	0	0.0
Other	1	16.7
Total	6	100.0

1. How does NFPA 1500 meet the needs of OCESD #1?

NFPA 1500 consists of 328 sections for a fire department to analyze against its own safety and health program. Of this number, only 281 sections were applicable to OCESD #1. Table 8 shows that OCESD #1 currently has taken action to meet 52.7% of the standard.

Table 8

NFPA 1500 Compliance by Applicable Sections

Sections	N	%
Meets	148	52.7
Does Not Meet	133	47.3
Total	281	100.0

There are 210 applicable sections of NFPA 1500 that require only administrative action such as developing Standard Operating Procedures (SOP's), setting guidelines, or making personnel appointments and job assignments. Of these administrative requirements, OCESD #1 currently meets 48.6% (Table 9).

Table 9

NFPA 1500 Compliance by Administrative Action Required

Administrative	N	%
Meets	102	48.6
Does Not Meet	108	51.4
Total	210	100.0

Fiscal action is required for 71 of the applicable sections, of which OCESD #1 meets 64.8% (Table 10).

Table 10

NFPA 1500 Compliance by Fiscal Action Required

Fiscal	N	%
Meets	46	64.8
Does Not Meet	25	35.2
Total	71	100.0

2. How does NFPA 1500 not meet the needs of OCESD #1?

Only 85.7% of the NFPA 1500 standard is applicable to Orange County Emergency Services District #1. The remaining 14.3% of the document involves requirements that are outside the scope of the District.

3. What does OCESD #1 need to do to correct the deficiencies identified in NFPA 1500?

Table 11 illustrates that of the remaining 133 sections of NFPA 1500 that are applicable to OCESD #1, 38.4% requires only administrative action if compliance is to be achieved. Fiscal action is required on only 8.9% of the 281 requirements.

Table 11

NFPA 1500 Compliance by Total Action Required

Action	N	%
<hr/>		
No Action Required	148	52.7
Administrative Action Required	108	38.4
Fiscal Action Required	25	8.9
Total	281	100.0

Table 12 presents the 108 administrative action requirements OCESD #1 needs for compliance, by year of compliance as follows: 1998, 72.2%; 1999, 16.7%; 2000, 8.3%; 2005, 2.8%.

Table 12

NFPA 1500 Administrative Action Required by Year of Compliance

Year	N	%
1998	78	72.2
1999	18	16.7
2000	9	8.3
2005	3	2.8
Total	108	100.0

NFPA 1500 fiscal action by compliance year is shown in Table 13. Compliance is as follows: 1998, 16.0%; 1999, 48.0%; 2000, 8.0%; 2005, 16.0%; 2010, 12.0%.

Table 13

NFPA 1500 Fiscal Action Required by Year of Compliance

Year	N	%
1998	4	16.0
1999	12	48.0
2000	2	8.0
2005	4	16.0
2010	3	12.0
Total	25	100.0

Table 14 presents the dollar amounts required for compliance with NFPA 1500 by year of compliance. Only 1.9% of the dollars needed for compliance is required before the year 2010.

Table 14

NFPA 1500 Fiscal Amount by Year of Compliance

Year	\$	%
1998	6,100	0.1
1999	47,000	0.8
2000	20,000	0.3
2005	40,000	0.7
2010	6,000,000	98.1
Total	6,113,100	100.0

DISCUSSION

1. How does NFPA 1500 meet the needs of OCESD #1?

The results of Table 1 and Table 5 illustrate that emergency operations, fireground and nonfire-emergencies, continue to be the place where OCESD #1 firefighters experience the greatest number of injuries. Additionally, Table 2 and Table 6 illustrate that the category wound, cut, bleeding, bruise, and the category strain, sprain, muscle pain continue to lead the greatest number of firefighter injuries. However, there is no correlation between the top category in Table 3 and Table 7. The

respondents to the survey (Table 7) indicated that the categories stepped on, contact with, and struck by were both number one, while the analysis in Table 3 indicated that the category fell, slipped, jumped was number one.

The survey indicated that 40% of the respondents that have on-the-job injuries strongly agree with the requirements of NFPA 1500, with the remaining 60% at least agreeing with the standard. Through the implementation of the standard, OCESD #1 could experience a 30% to 60% decrease in the direct costs resulting from on-the-job injuries as was stated by Coleman (1994, p. 5). This Workers' Compensation financial savings could enable OCESD #1 from being placed on the TWCC Extra-Hazardous Employer Program. As was stated by Peterson (1997, p. 10-64), a fire department occupational safety and health program developed and implemented in compliance with NFPA 1500 is instrumental in securing the highest possible levels of health and safety, given the hazardous nature of firefighting.

Table 8 illustrates that OCESD #1 currently has implemented 52.7% of the standard. Of the 47.3% (Table 11) of the standard with which the District does not comply, 38.4% requires administrative action while 8.9% requires financial action. The administrative action required ranges from development of SOP's, setting guidelines, or appointing personnel to various job assignments. The 108 specific administrative requirements (Table 9) with which the District must still comply are outlined in Appendix A. The 25 financial requirements illustrated in Table 10 will require long-term planning

(Appendix A). By implementing these requirements, the District's occupational safety and health program would meet the requirements of OSHA's Subpart L, the same regulation placed on the private sector and utilized by private safety professionals (Fornell, 1993, p. 64). OCESD #1 can also use NFPA 1500 as a benchmark for a good safety program (Rubin, 1993, p. 46). Rubin and Foley (1993, p. 46) note that injury reduction will be realized through the implementation of NFPA 1500. As was identified in the problem statement, injury reduction through the implementation of NFPA 1500 was the objective of the research project.

2. How does NFPA 1500 not meet the needs of OCESD #1?

The results indicated that 14.3% of the document was outside the scope of the District. However, none of the results indicated that implementation of the standard would not meet the needs of the District. Rather, as was noted by Brunacini, OCESD #1 must take control of its own future by adopting NFPA 1500 (Manning, 1992, p. 8). Also, as was stated by Fornell (1993, p. 64), NFPA 1500 can be cited as a prevailing standard of care and used as law whether or not the standard is adopted. While the District currently has safety requirements, those not developed in accordance with NFPA 1500 can be considered substandard or unsafe (Turner, 1990, p. 3).

3. What does OCESD #1 need to do to correct the deficiencies identified in NFPA 1500?

Table 11 shows that the District must take administrative action on 38.4% of the

standard and 8.9% of the fiscal action. As was stated, in order to meet the administrative action requirements, the District must develop the procedures and implement the programs. Table 12 shows that 72.2% of these administrative requirements can be implemented during 1998, while the remaining 27.8% of the administrative requirements requires some type program development or research during the next seven years. Appendix A shows the actual administrative section implementation by year.

As for the fiscal action required, the District must work within the budget process for the implementation of these requirements. Table 13 illustrates the number of fiscal requirements to be implemented by year, while Appendix A shows the actual fiscal sections by year of implementation. It can be seen in Table 14 that only 1.9% of the total dollar amount required for implementation is required before the year 2010. Appendix A illustrates that the final year of the fiscal implementation, 2010, will require a capital improvement plan.

RECOMMENDATIONS

1. OCESD #1 must adopt NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, to reduce the frequency and severity of job-related injuries. By implementing the standard, the District can utilize a program that is recognized as a prevailing standard of care and avoid being placed on the TWCC Extra-Hazardous Employers Program.

2. OCESD #1 must implement the time frames that were identified in the NFPA 1500 Worksheet for the administrative and fiscal sections. These implementation times will allow OCESD #1 to manage effectively the risks associated with firefighting and budget the appropriate dollars needed for the programs.
3. OCESD #1 must budget for the items identified in the research. Additionally, the management of the District must develop a capital improvement plan for those sections identified in Appendix A and Table 14.
4. OCESD #1 must develop an organizational attitude that does not reward nor recognize injuries as “part of the job.” Rather, management must perpetuate an attitude that injuries are preventable.

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